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CONTENTS

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THE BOLYAI PRIZE[1]

THE problems treated by Hilbert are so varied and their importance is so evident that a long preamble seems unnecessary. It is preferable to enter immediately upon the detailed exposition of his principal memoirs. The reader in the presence of results so important will himself draw conclusions.

INVARIANTS

The first works of Hilbert relate to invariants. We know with what passion this part of mathematics was cultivated about the middle of last century and how it has since been neglected. It seemed in fact that Clebsch, Gordan, Cayley and Sylvester had used up all that it was possible to deduce from the old methods and that after them there remained only slight gleanings. But the progress of algebra and arithmetic, and in particular the theory of whole algebraic numbers, the extension soon made of it to integral polynomials, and Kronecker's theory of moduli, made possible the approach of the question from a side still unexplored.

This Hilbert did in attacking at first the celebrated theorem of Gordan, according to which all the invariants of a system of forms can be expressed in a rational and integral way as functions of a finite number of them.

We could not better measure the advance made than by comparing the volume Gordan had to devote to his demonstration with the few lines with which Hilbert has been satisfied. The method gained in gen-

[1] Report on the works of Hilbert by Poincaré. Translated by G. B. Halsted.